FIG. 1
(Related Art)

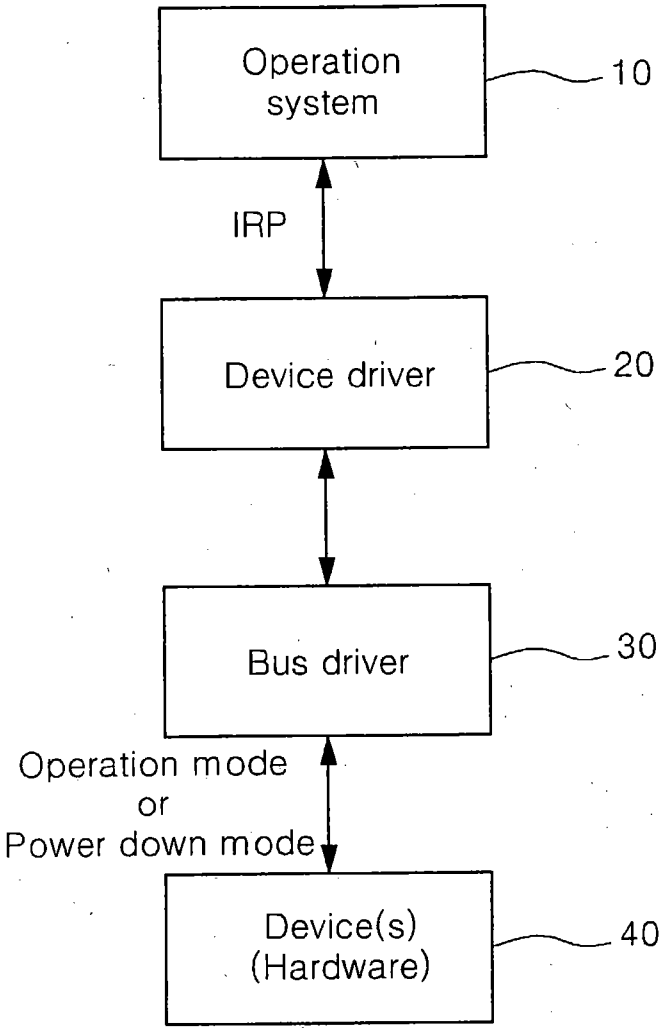


FIG. 2

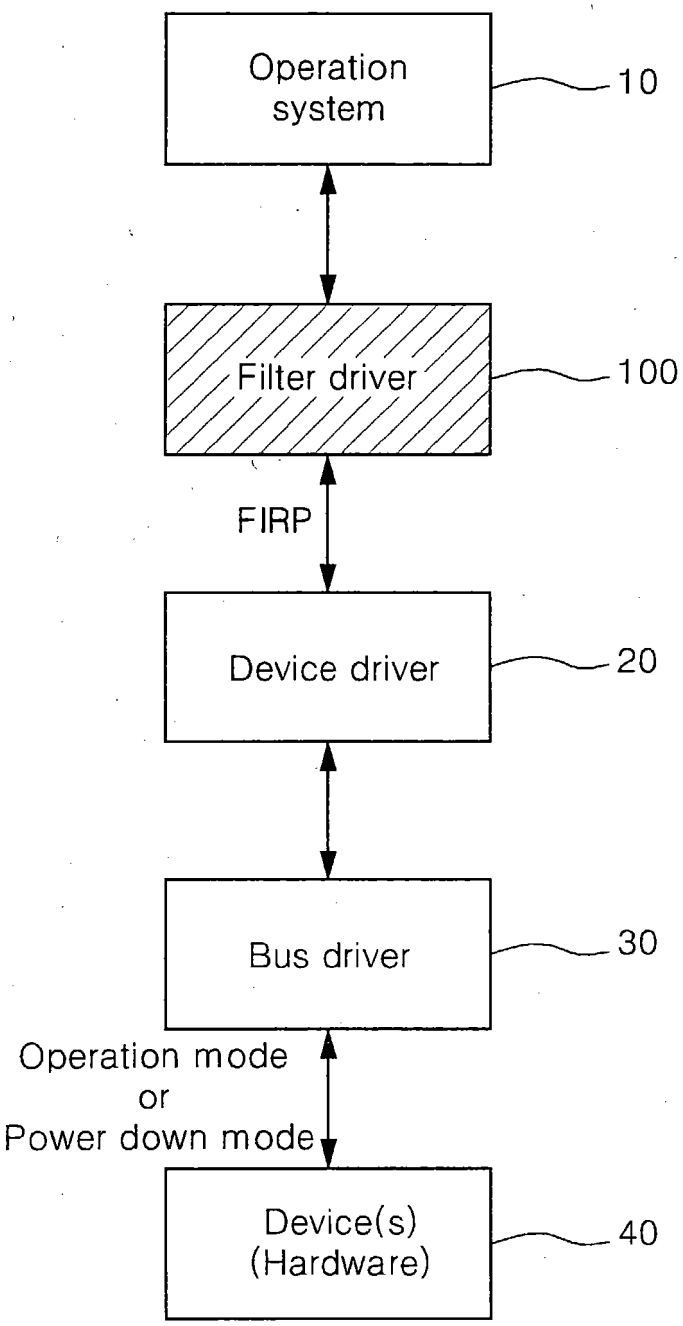

Operation system
10
Filter driver
100
FIRP
Device driver
20
Bus driver
30
Operation mode
or
Power down mode
Device(s)
(Hardware)
40

FIG. 3

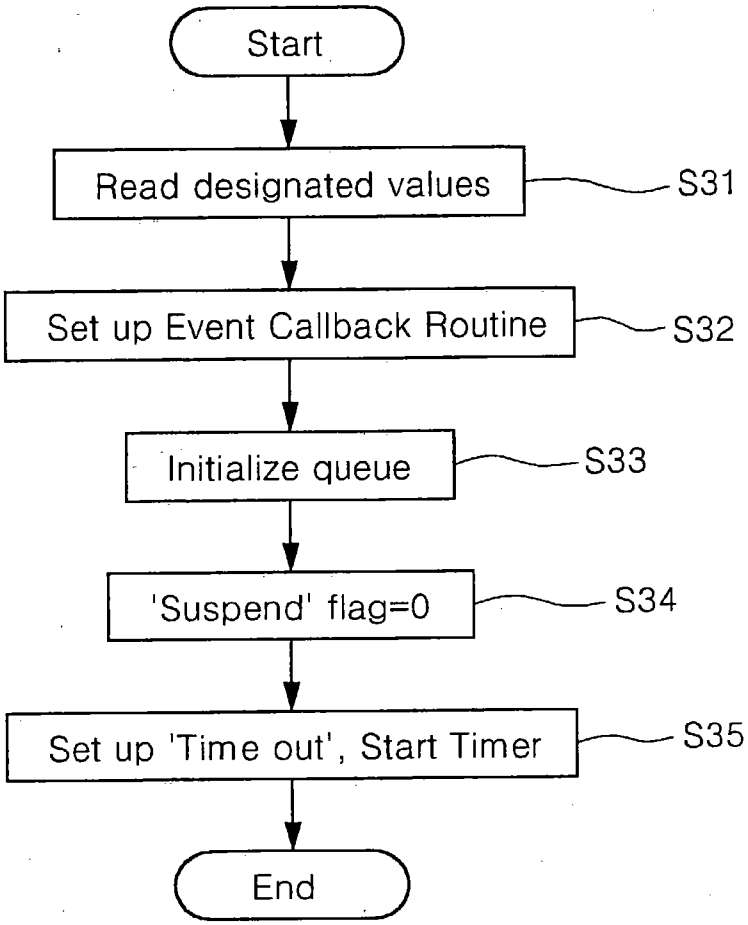

Start
Read designated values
S31
Set up Event Callback Routine
S32
Initialize queue
S33
'Suspend' flag=0
S34
Set up 'Time out', Start Timer
S35
End

FIG. 4

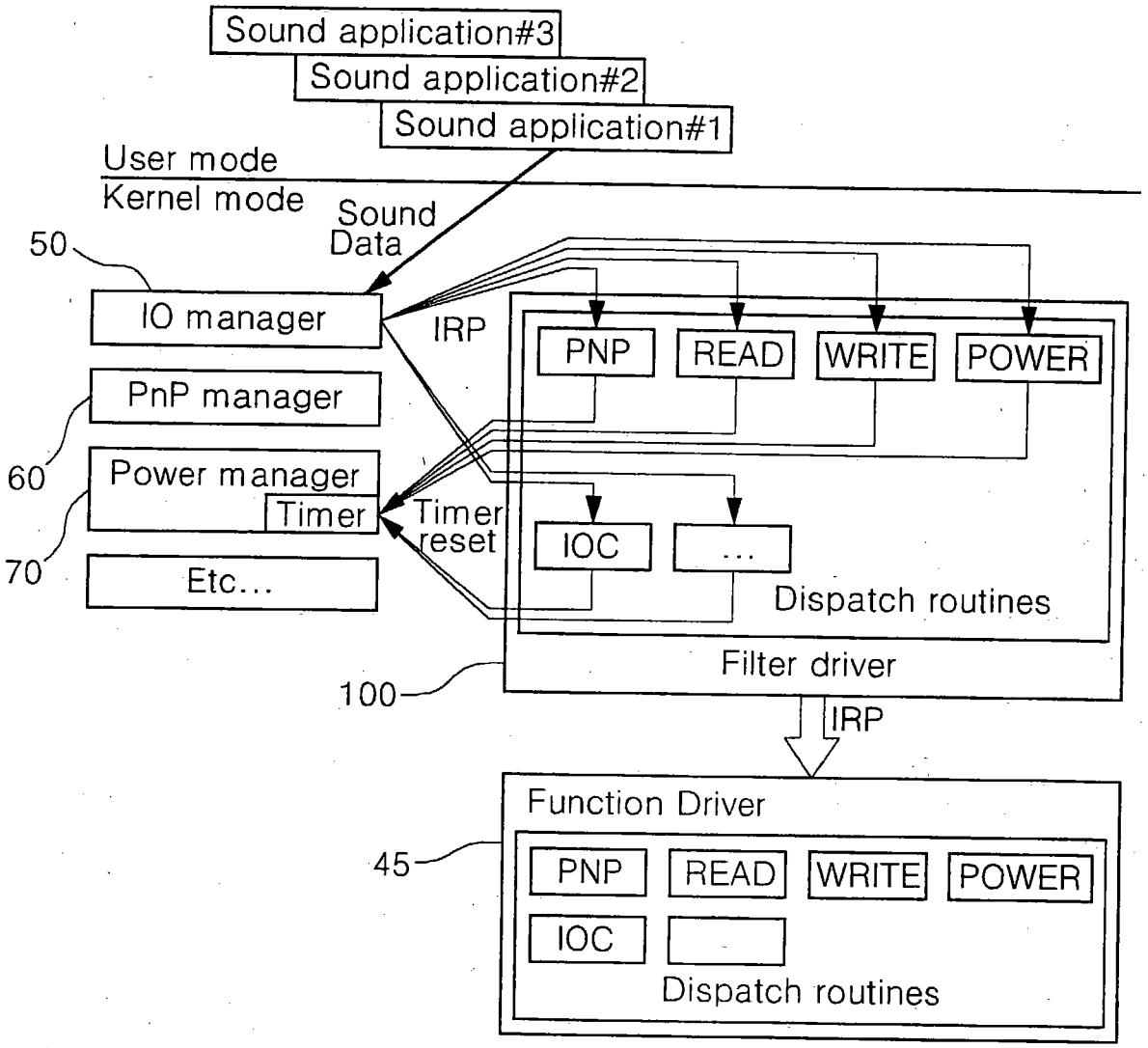

Sound application#3
Sound application#2
Sound application#1
User mode
Kernel mode
Sound Data
50
IO manager
PnP manager
60
Power manager
Timer
70
Etc...
IRP
Timer reset
PNP
READ
WRITE
POWER
IOC
...
Dispatch routines
Filter driver
100
IRP
Function Driver
45
PNP
READ
WRITE
POWER
IOC
Dispatch routines

FIG. 5

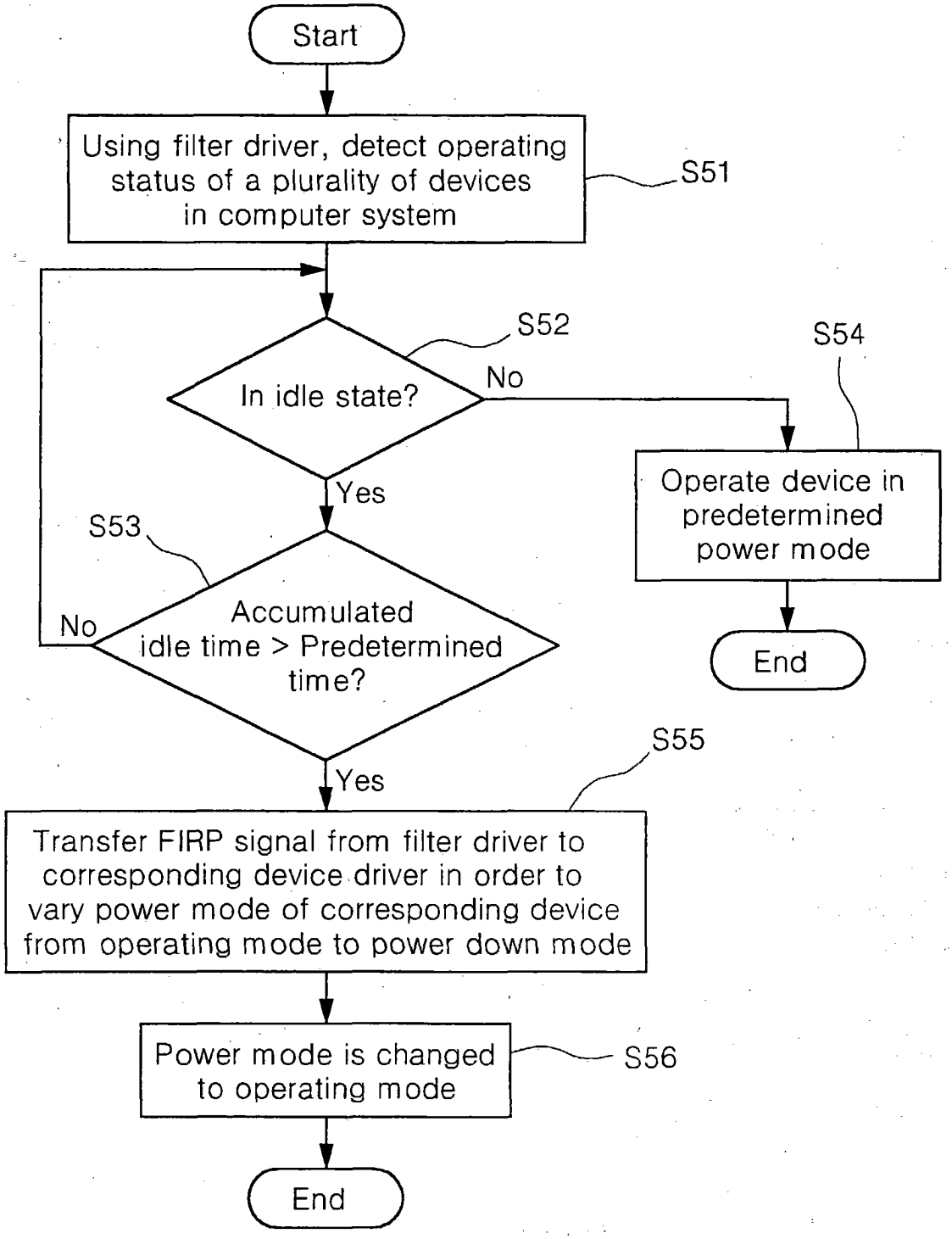

Start
Using filter driver, detect operating status of a plurality of devices in computer system
S51
S52
In idle state?
No
S54
Operate device in predetermined power mode
End
Yes
S53
No
Accumulated idle time > Predetermined time?
Yes
S55
Transfer FIRP signal from filter driver to corresponding device driver in order to vary power mode of corresponding device from operating mode to power down mode
Power mode is changed to operating mode
S56
End

FIG. 6

```
NTSTATUS
  PoRequestPowerIrp(
    IN PDEVICE_OBJECT  DeviceObject,
    IN UCHAR  MinorFunction,
    IN POWER_STATE  PowerState,
    IN PREQUEST_POWER_COMPLETE  CompletionFunction,
    IN PVOID  Context,
    OUT PIRP  *Irp OPTIONAL
    );
```

FIG. 7

```
PULONG
 PoRegisterDeviceForIdleDetection(
    IN PDEVICE_OBJECT DeviceObject,
    IN ULONG ConservationIdleTime,
    IN ULONG PerformanceIdleTime,
    IN DEVICE_POWER_STATE  State);
```

FIG. 8

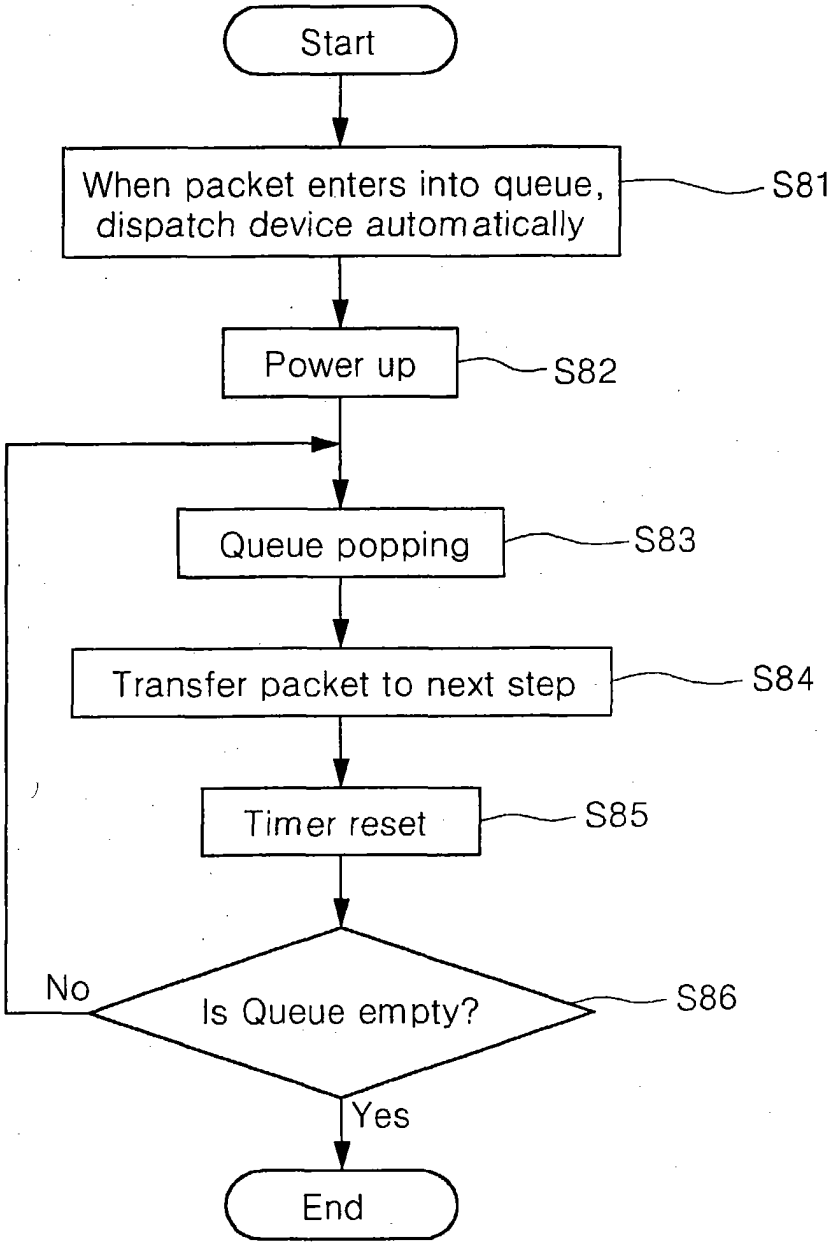

Start
When packet enters into queue, dispatch device automatically
S81
Power up
S82
Queue popping
S83
Transfer packet to next step
S84
Timer reset
S85
Is Queue empty?
S86
No
Yes
End

FIG. 9

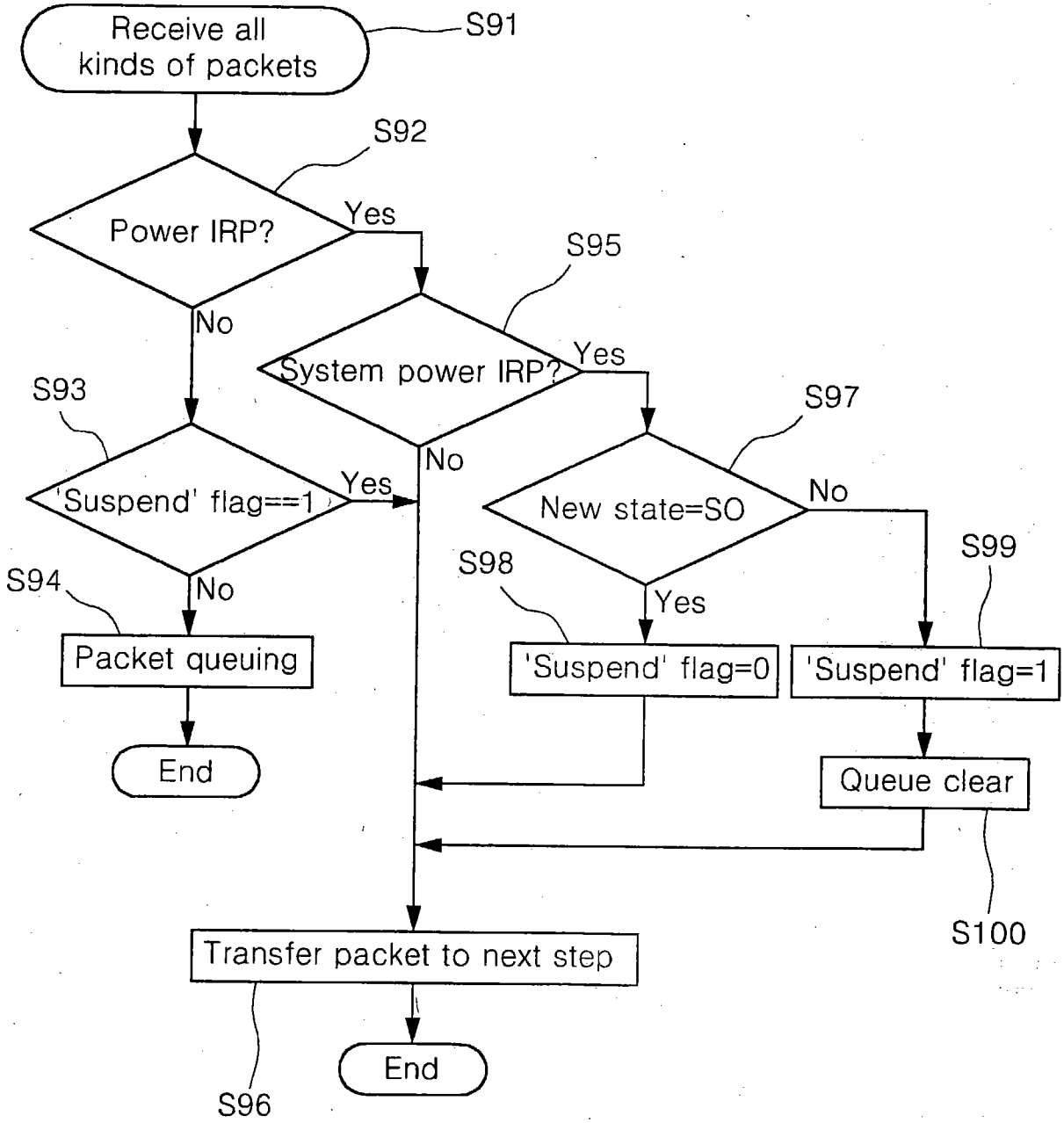
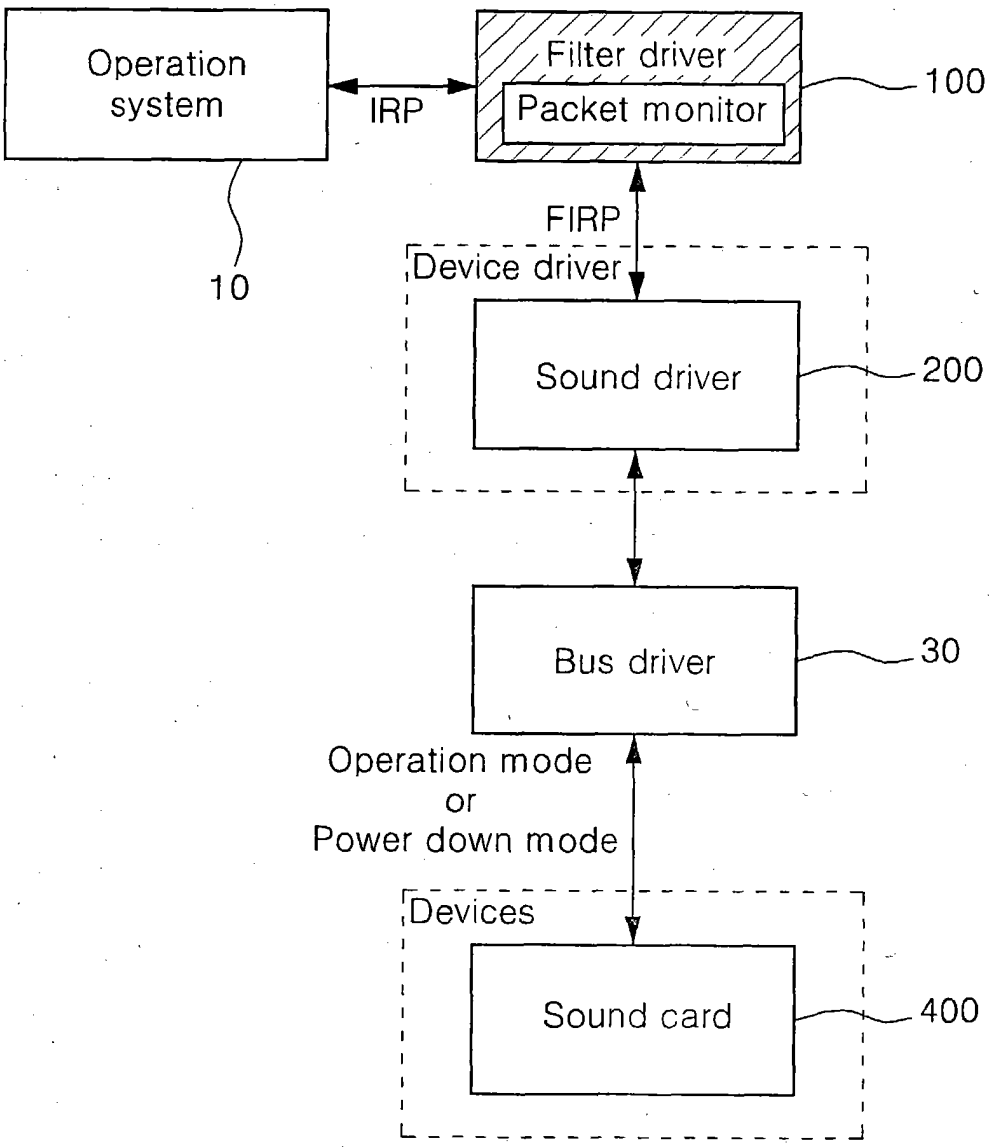

Receive all kinds of packets
S91
S92
Power IRP?
Yes
No
S95
System power IRP?
Yes
No
S93
'Suspend' flag==1
Yes
No
S94
Packet queuing
End
S97
New state=SO
No
Yes
S98
'Suspend' flag=0
S99
'Suspend' flag=1
Queue clear
S100
Transfer packet to next step
S96
End

FIG. 10


Operation system
IRP
Filter driver
Packet monitor
100
10
FIRP
Device driver
Sound driver
200
Bus driver
30
Operation mode
or
Power down mode
Devices
Sound card
400